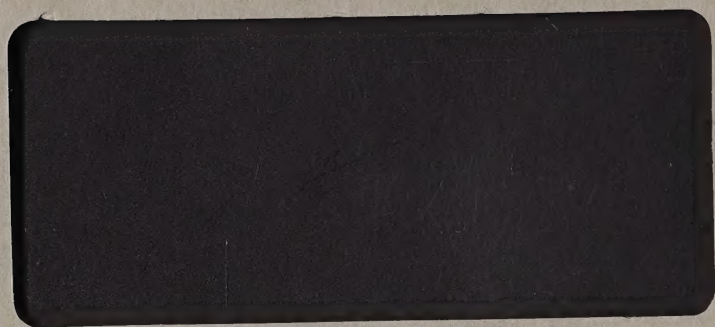






OPERATING INSTRUCTION MANUAL



MODEL H-3

SERIAL # 3430

SWEEP GENERATOR

SPECIFICATIONS

MODEL H-3

SWEEP GENERATOR

CENTER FREQUENCY	1-200mc.
FREQUENCY RANGE	1-300 mc.
SWEEP WIDTH	200 kc.--200 mc.
OUTPUT IMPEDANCE	50 ohms (BNC Connector)
OUTPUT VOLTAGE	.4 v. p. to p.
FLATNESS	Within 15% over max. sweep width.
DISPLAY LINEARITY	1.1:1
ATTENUATION	0, 10, 20, 30, 40, 50 db. -- step-attenuator plus vernier attenuation of over 10 db.

MARKER SYSTEM

Birdy-By-Pass Marker Circuitry

The output of the crystal marker oscillators and the input from the external marker input is mixed with a sample of the sweep oscillator signal to produce beatnotes or birdies. These are amplified and superimposed upon the detected R.F. output signal before it is applied to the vertical scope input. Amplitude of the markers is adjustable over a wide range.

Crystal Markers

Provision for 6 interchangeable crystal controlled plug-in markers. (Frequency to be specified by customer.)
Accuracy of crystals -- .005%

External Marker Input

SCOPE HORIZONTAL SWEEP VOLTAGE

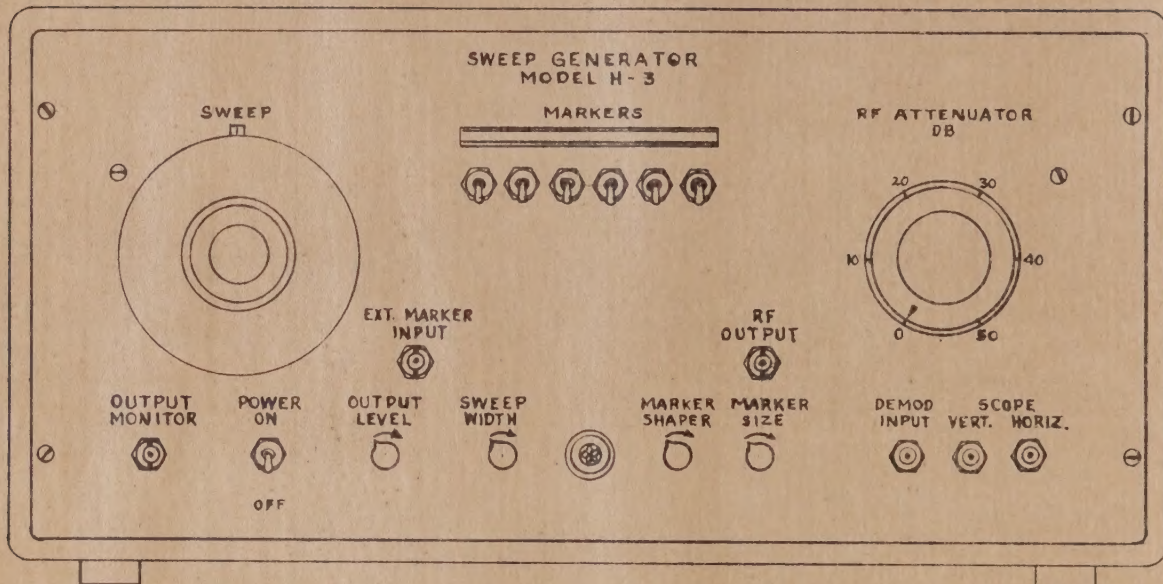
ZERO BASE LINE

POWER

110-120 v., 50-60 cps, 50 w., fuse--2 amps.

PHYSICAL DESCRIPTION

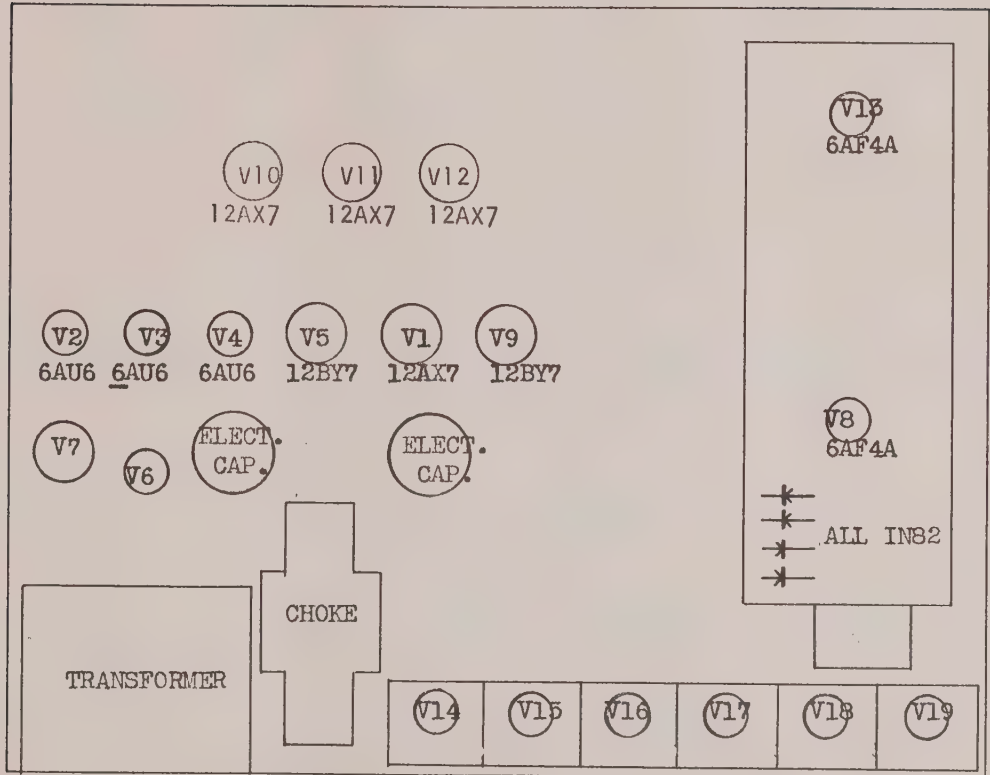
23" X 16" X 13" gray enameled case.
8 3/4" X 19" gray front panel (anodized)
Weight -- approximately 50#

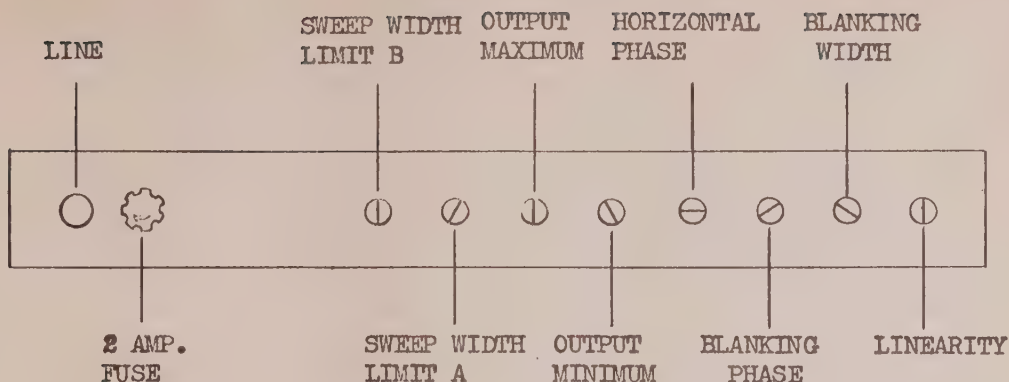


DESCRIPTION OF FRONT PANEL

SWEEP DIAL	Reads center frequency of sweep oscillator (cal. at zero sweep width).
SWEEP WIDTH	Varies the amount of voltage supplied to the vibrating capacitor.
OUTPUT LEVEL	Determines the average B plus supplied to the sweep oscillator and may be used as a vernier control of the output level.
RF ATTENUATOR	Provides indicated amounts of attenuation in the output circuit.
MARKER SIZE	Varies the amplitude of the markers.
MARKER SHAPER	Varies the shape of the markers by varying the frequency response of the Birdy-By-Pass circuit. When operating at high sweep widths, set clockwise to eliminate D. C. response from the crystal mixers. When operating at narrow sweep widths, set counter-clockwise to produce narrower markers.
FIXED MARKERS (toggle switches)	In "ON" position, supplies B plus individually to marker oscillators.
OUTPUT MONITOR	May be connected to the vertical input of scope to show the output response curve.
RF OUTPUT	Sweep output.
EXTERNAL MARKER INPUT	For external markers, connect any C. W. signal of .05 V. or more.
DEMODULATED INPUT	The demodulated signal from the device being tested is fed to this connector to be superimposed with marker signals.
SCOPE VERTICAL	Connect to the Vertical terminals of scope.
SCOPE HORIZONTAL	Connect to the Horizontal terminals of scope.
ON/OFF	Power switch.
(PILOT LIGHT)	Use #47 bulb.

CHASSIS LAYOUT -- MODEL H-3





FUNCTION OF REAR PANEL CONTROLS

BLANKING WIDTH

This potentiometer is the grid resistor of the blanking pulse amplifier (V2). It is adjusted to blank slightly more than one-half of the sweep cycle to produce a zero base line.

BLANKING PHASE

By this screw-driver adjustment, the phase of the blanking voltage may be adjusted to blank the return sweep of the sweep oscillator.

HORIZONTAL PHASE

By this screw-driver adjustment, the horizontal output may be adjusted to be in phase with the sweep oscillator.

AMPLITUDE MINIMUM LIMIT

This control is in series with the front panel control and is used to adjust the output level when the front panel control is at minimum position.

AMPLITUDE MAXIMUM LIMIT

This control is in parallel with the front panel control and is used to adjust the output level when the front panel control is at maximum position.

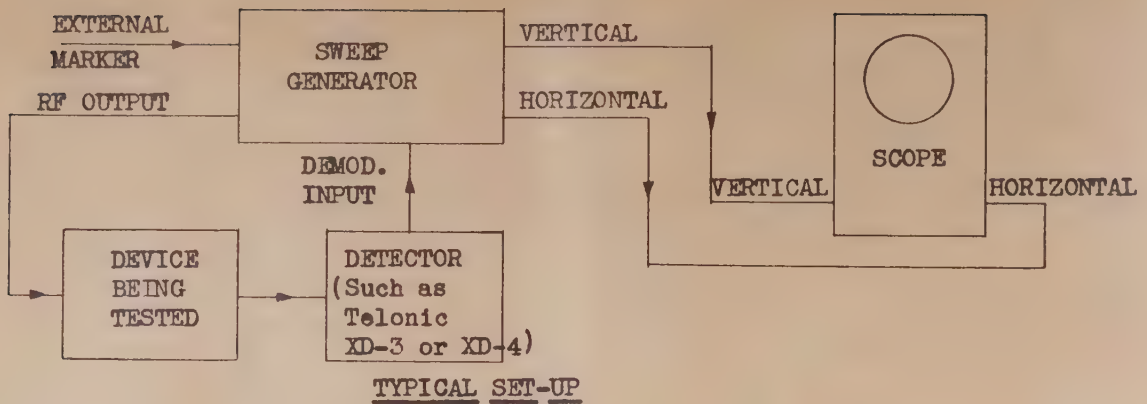
SWEEP WIDTH LIMIT A & B

The LIMIT controls A & B determine the voltages supplied to the Front Panel Sweep Width dual potentiometer and are used to adjust the sweep width when the front panel control is set at maximum. The two sweep oscillators are operating out of phase with each other and the non-linearity present at such wide sweeps cancels out. Thus the two limit controls are set not only to provide full sweep width but are also set for best linearity.

LINEARITY

This control can be used to change the waveform of the horizontal output. It is normally set for best linearity at maximum sweep width.

OPERATING INSTRUCTIONS



The following procedure is recommended for setting up this instrument in test position.

1. Connect unit to 110/120 v., 50/60 cps supply and switch power on.
2. Make connections to detector and oscilloscope as shown above, omitting the "device under test".
3. Set OUTPUT LEVEL to max. (clockwise) and ATTENUATOR to zero position.
4. Set sweep width to maximum (clockwise).
5. Turn Marker Switch on or inject external CW signal to produce a marker.
6. Rotate SIZE control clockwise until markers are of convenient size.

REAR PANEL CONTROLS are adjusted at factory and instrument is ready to use. However, should it be desirable to check these adjustments, follow these steps:

1. The OUTPUT LEVEL LIMIT adjustments on the rear panel occasionally need adjustment. Normally the AMPLITUDE Control on the Front Panel will provide at least 10 db. attenuation. To readjust the AMPLITUDE Control limits follow this procedure:
 - a. Rotate the Front Panel AMPLITUDE Control to minimum.
 - b. Adjust the minimum LIMIT Control on rear panel for minimum output maintaining a constant level over the entire band.
 - c. Rotate the Front Panel LEVEL Control to maximum.
 - d. Adjust the MAXIMUM AMPLITUDE LIMIT to maximum output maintaining constant output over the entire range. This should result in at least 10 db. variation.
2. The next adjustments to be made are the BLANKING WIDTH, BLANKING PHASE and HORIZONTAL PHASE.
 - a. Adjust the HORIZONTAL PHASE AND BLANKING WIDTH to produce a rectangular waveform.

OPERATING INSTRUCTIONS CONTD.

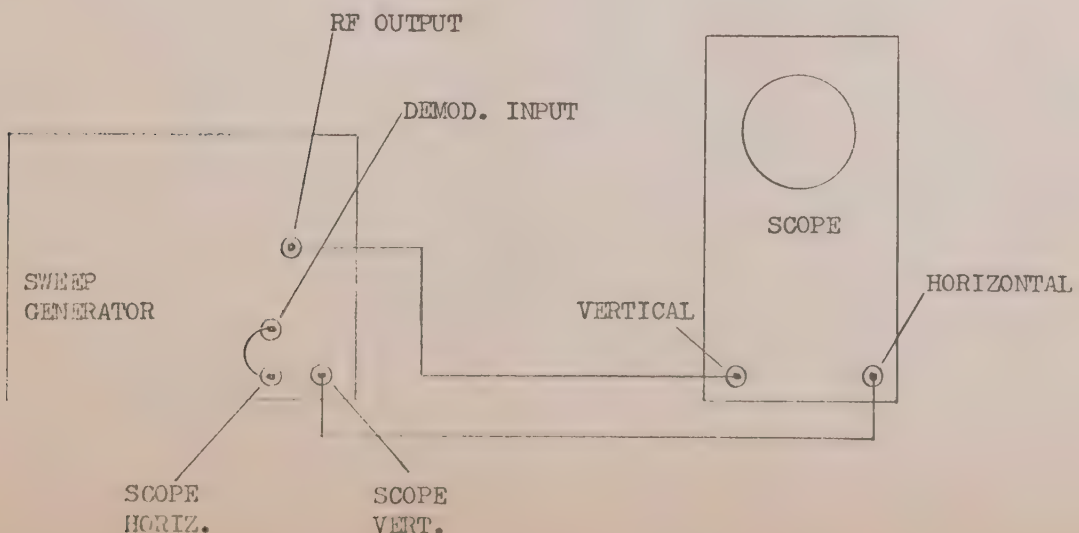
- b. With the marker present either from the internal markers or from an external marker input, tune the sweep oscillator until a pip appears on the waveform. If the BLANKING PHASE is misaligned, a second pip may appear on the edge of the waveform. This pip will converge with the first pip at the point where the sweep oscillator reaches the end of its sweep and reverses direction. The BLANKING PHASE should be adjusted to cut-off at this point.
 - c. Readjust the HORIZONTAL PHASE and BLANKING WIDTH to again produce a rectangular waveform.
3. With the SWEEP WIDTH control on the front panel turned to maximum, adjust the two SWEEP LIMIT controls on the rear panel for the desired sweep width and for equal amounts of sweep from the center frequency. Control "A" affects primarily the high frequency end of the sweep, and control "B" the low end.
4. LINEARITY may best be adjusted when a number of markers are present on the display. In the factory a 10 mc. harmonic generator is used for this purpose. The linearity control is adjusted for equal spacing between the 10 mc. marker points. If such a signal is not at hand, a variable marker may be used. The LINEARITY adjustment is made so that there is an equal spacing from the center of the presentation to each side. This adjustment is to be made at maximum sweep width.

Use of Birdy-By-Pass Marker On Scope Presentation of Undetected Video.

Adding the "birdy-pip" to an undetected RF signal is not satisfactory, however the marker may be added to the horizontal waveform.

The Horizontal output is connected with a short jumper to the demodulator input and the terminal marked vertical is connected to the horizontal sweep input of the oscilloscope.

The marker pip superimposed upon the horizontal sweep waveform will cause a momentary variation in the video envelope being displayed and cause a change of brightness, appearing as a darkened line.



GENERAL DESCRIPTION

BLANKING AND HORIZONTAL CIRCUITRY

The blanking and horizontal sweep voltages are originated by square wave producing circuits. The 6.3 v. filament windings and the 6.3 v. phasing windings of the power transformers are connected in series to obtain a 12.6 voltage center-tapped to ground. This voltage is connected through the phasing networks to one of the grids of the 12AX7 and to the grid of the 6AU6.

The square wave output of V2 controls V5, which is the sweep oscillator voltage regulator tube and thus deprives the tuned oscillator of voltage during one-half of each cycle. The phase of this blanking voltage is adjusted by the rear panel control so that the lowest frequency being swept is located at the left of the scope presentation. The square wave output of one triode of the 12AX7 is applied to the other triode through an RC network. This network is designed to produce a non-linear sawtooth waveform. A potentiometer in this circuit allows the shape of the waveform to be adjusted.

The second triode is connected as a cathode follower and produces the same sawtooth output. This horizontal sweep voltage compensates for the non-linear characteristics of the vibrating sweep capacitor and results in an almost perfectly linear presentation on the oscilloscope.

AUTOMATIC OUTPUT LEVELING CIRCUITRY

A sample of the tuned oscillator output is detected and amplified and is used to control the plate voltage of the tuned oscillator. The OUTPUT LEVEL control adjusts the bias on the first stage of the amplifier. This causes the DC levels in the entire amplifier to change and varies the average B plus supplied to the tuned oscillator from a minimum of 25 volts to over 100 volts. A small decrease in the sampling voltage causes a large increase in the B plus supplied to the sweep oscillator and thus counteracts any amplitude variation as the oscillator is tuned over the range.

The operation of this circuit and of the tuned oscillator can be checked at the leveler connection at the top of the detector block. (In some units this point is brought out as the MONITOR on the front panel.) The waveform at this point will normally show a flat output level over the entire band. Adjusting the OUTPUT LEVEL should change this level. This control should be set at the maximum level that can be obtained and still have uniform response over the range.

MARKER SYSTEM DESCRIPTION

A sample of the sweep oscillator is mixed with a fundamental or harmonic of the crystal oscillator to produce a beat frequency "pip" or "birdy". The amplitude of the birdy is amplified and superimposed upon the demodulated swept signal and applied to the vertical amplifier of the oscilloscope. The size of the marker may be varied over a wide range by the gain control of the "birdy" amplifier.

EXTERNAL MARKER INPUT

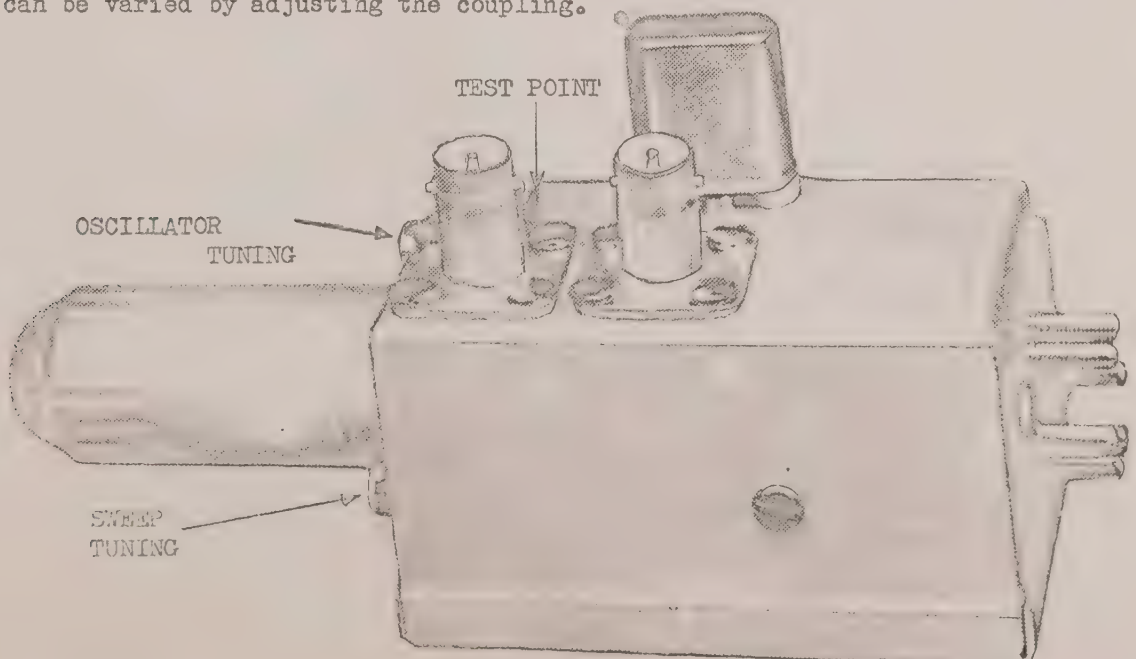
A separate mixer is provided for the external marker input. A low level sweep signal is introduced into the mixer so that a "birdy" is produced as the sweep crosses the input CW marker signal. The birdy is applied to the marker amplifier along with the other markers.

CRYSTAL OSCILLATORS (OPTIONAL)

These crystal markers are self contained plug in units. Additional units at other frequencies (within the range of the sweep generator) may be ordered and substituted for the original units.

The crystal oscillator units include the tube, crystal, oscillator, tuning, mixer crystal diode and a tuned circuit selecting the sweep input frequency. A test point is provided for easy adjustment of the crystal oscillator. In making this adjustment, the crystal oscillator coil slug is adjusted for near maximum voltage at the test point. This is usually in the order of 2-5 volts as measured with a VTVM. The adjustment should be made just slightly off the peak on the low inductance side. The effects of tuning are critical on the other side of the resonance curve.

By tuning the sweep sample coil, the frequency of the sweep input signal can be varied and thus minimize unwanted markers generated from other harmonics from the crystal oscillator. The amplitude can be varied by adjusting the coupling.



MAINTENANCE

This instrument is designed for easy maintenance. All tubes and components are of standard types and are easy to remove and replace. By use of the schematic. Block diagram, terminal board layout, voltages and waveforms, ordinary difficulties can be readily located and remedied. The following trouble-shooting chart is an additional add to servicing:

<u>SYMPTOMS</u>	<u>POSSIBLE CAUSES & REMEDIES</u>
Pilot light off and unit fails to operate	Fuse open -- replace. If 2nd fuse opens -- look for cause of overload, shorted wiring, components, etc. (The 150 ohm, 2 watt resistors on terminal board burn out if the B plus circuit is overloaded and this protects the rectifier and transformer.)
No Horizontal Output	Look for difficulty in the sawtooth circuitry V1 using terminal board layout and schematic to check waveforms and voltages.
R. F. Output is Low or Zero	Check B plus to sweep oscillator (cathode of V5). It should be a square wave of 25-100 v. of positive polarity and should vary as the output level control varies. If it is normal, look for RF difficulties--bad tube, shorted or open wiring, defective components, etc. If the voltage is low and does not respond to the leveler control, remove first V4 and then V2. When either of these tubes conducts, the voltage on the grid of V5 is reduced, decreasing the B plus to the sweep oscillator. If removal of V2 allows B plus on V5 to return to normal, check the blanking width control, the tube and associated circuitry. If removal of V4 causes the B plus to return to normal, check the leveler controls, V3 and V4 and circuitry.
Low Output	Replace mixer diodes, in sweeper box, observing correct polarity as noted on chassis layout.

POOR LEVELING

The monitor output serves as a very convenient check of the sweep generator performance. With the OUTPUT LEVEL control set for max. output, the voltage at the monitor should be over .4 v.. A lower voltage than this indicates poor operation of the crystal diode, sweep oscillator or amplitude leveling circuit.

If the sweep output is higher than normal and the OUTPUT LEVEL control has little or no effect, the monitor, diode D601 is probably faulty: the diode or insulated plate is shorting to ground; or the crystal is making poor contact.

If the leveling circuit is working, but the output drops off at certain frequencies, the 6AF4A should be replaced.

Sometimes poor operation of the sweep oscillator tube appears as a tendency of the leveling circuit to oscillate at an audio frequency. This effect occurs when the B plus voltage level is too low for the sweep oscillator to operate but when the amplifier is not biased down to the point where it will allow the sweep osc. to stop. It is more likely to take place at the extreme high end of the band at low operating levels. Usually the amount of attenuation possible through use of the OUTPUT LEVEL control, before this oscillation takes place, is a direct indication of the quality of the sweep oscillator tube (6AF4A).

When this tube is replaced, the best results can be obtained by trying several tubes and then choosing the one that produces the most constant output. The Sonotone 6AF4A operates better in this circuit than other brands.

A flicker or break in the output level can sometimes occur if for some reason the OB2 regulator circuit isn't receiving enough voltage. Low line voltage or a change of tube characteristics could account for this. Shunting the dropping resistor R10, usually eliminates the difficulty.

INTERMITTENT SWEEP TUNING

A special lubricant is used on the sliding contacts and lines. This grease has exceptionally good contact and wearing qualities and will last indefinitely. No other lubricant should be added. Even though this lubricant imparts a "squeaky" feel to the tuning, the silver overlay on the contacts and lines will show little wear after years of use. In the event that electrical noise develops, in spite of all precautions made in the manufacture, the following procedure is recommended:

1. Pry brass keeper loose from contact rotor.
2. Pull rotor away from lines.
3. Carefully spread contacts so as to increase contact pressure.
4. Replace rotor, being very careful not to damage contacts.
5. Rotate the rotor on the shaft for correct frequency range between stop limits and tighten rotor keeper.

PARTS LIST

TUBES

CIRCUIT REF. #	TYPE	DESCRIPTION
V1	12AX7	Horizontal Sweep Generator
V2	6AU6	Blanking Generator
V3	6AU6	Leveler
V4	6AU6	Leveler
V5	12BY7	Sweep Oscillator Voltage Regulator
V6	0B2	B plus Voltage Regulator
V7	5Y3GT	B plus Supply
V8	6AF4**	Fixed Sweep Oscillator
V9	12BY7	Same as V5
V10	12AX7	Birdy-By-Pass
V11	12AX7	" " "
V12	12AX7	" " "
V13	6AF4**	Tunable Sweep Oscillator
V14-V19	6CB6	Marker Oscillator

** Replace only with SONOTONE or RCA

DIODES

CIRCUIT REF. #	DESCRIPTION	CIRCUIT REF. #	DESCRIPTION
D501	1N82	D504	1N82
D502	1N82	D505	1N23
D503	1N82	D701	1N82

CAPACITORS

CIRCUIT REF. #	DESCRIPTION	CIRCUIT REF. #	DESCRIPTION
C1a	10 mf.-450 V.	C507	1,000 mmf. feed thru
b	80 mf.-450 V.	C508	" " " "
c	40 mf.-50 V.	C509	4 mmf.-600 V.
C101	.1 mf.-200 V.	C510	*3 mmf.-600 V.
C102	.01 mf.-500 V.	C511	3 mmf.-600 V.
C103	.1 mf.-200 V.	C512	.01 mf.-500 V.
C201	.1 mf.-200 V.	C701	1,000 mmf.--500V
C202	.01 mf.-500 V.	C702	" " -feed thru
C301	50 mf.-25 V.	C703	.01 mf.-600 V.
	electrolytic	C704	1000 mmf. " "
C501	1,000 mmf. feed thru	C705	.01 mf. " "
C502	" " " "	C706	" " " "
C503	" " " "	C707a	40 mf.-450 V.
C504	" " " "	b	" " " "
C505	" " " "	C708	120 mmf.-600 V.
C506	" " " "	C709	" " " "

* Values of component parts subject to adjustment at the factory.

PARTS LIST

RESISTORS

CIRCUIT REF. #	DESCRIPTION	CIRCUIT REF. #	DESCRIPTION
R10	*12.5K, 10 W	R507	18 ohm, ½ W
R11	47 ohm, 1 W	R508	100 ohm, ½ W
R12	150 ohm, 2 W	R509	10 K, ½ W
R13	150 ohm, 2 W	R701	220 ohm, ½ W
R101	560 K, ½ W	R702	470 " "
R102	100 K, ½ W	R703	56 ohm, ½ W
R103	1.5 M, ½ W	R704	" " " "
R104	1 M, ½ W	R705	100 ohm, ½ W
R301	1 M, ½ W	R706	1 K, ½ W
R302	12 K, 5 W	R707	" " " "
R303	6 K, 5 W	R708	" " " "
R304	1 K, ½ W	R709	" " " "
R305	560 K, ½ W	R710	56 K, 2 W
R306	39 K, ½ W	R711	47 K, ½ W
R307	2.2 K, ½ W	R712	10 K, ½ W
R401	120 ohm, ½ W	R713	5 K, 20 W
R501	120 ohm, ½ W	R714	12.5 K, 10 W
R502	*10 K, ½ W	R715	47 K, ½ W
R503	56 ohm, ½ W	R716	100 K, ½ W
R504	120 ohm, ½ W	R717	4.7 K, ½ W
R505	*4.7 K, ½ W	R718	47 K, ½ W
R506	290 ohm, ½ W	R719	2.2K, ½ W
		R720	51 ohm BNC Plug

CONTROLS

CIRCUIT REF. #	PART #	DESCRIPTION
P1	CS8210	25 ohm, 2 W -- Sweep Limit A-R. P.
P2	CS8210	" " " " " " B-R. P.
P3 A & B	CY9556	6 ohm, 2 W -- " Width F. P. (dual)
P101	EB7154	200 K, ¼ W -- Horizontal Phase R. P.
P102	CF3179	100 K, ½ W -- Linearity R. P.
P201	EB7154	200 K, ¼ W -- Blanking Phase R. P.
P202	EL8410	2 M, ¼ W -- Blanking Width, R. P.
P301	EL8409	50 K, ¼ W -- Minimum Level R. P.
P302	CF3179	100 K, ½ W -- Level F. P.
P303	EB7154	200 K, ¼ W -- Maximum Level R. P.
P701	CF3179	100 K, ¼ W -- Marker Shaper F. P.
P702	CF3179	100 K, ¼ W -- Fixed Markers (size) F. P.

*Values of component parts subject to adjustment at the factory.

PARTS LIST

SWITCHES

CIRCUIT REF. #: S1
S701

DESCRIPTION: S.P.B.T., 3A-F.P.
S.P.D.I.

TRANSFORMERS

CIRCUIT REF. #: T1

DESCRIPTION: Power Transformer

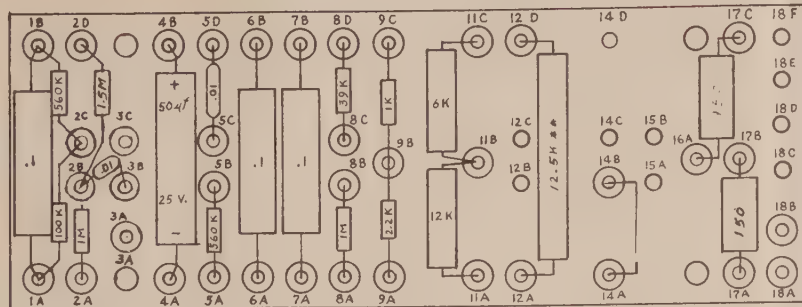
COILS

CIRCUIT REF. #	DESCRIPTION
L1	Filter Choke
L501 A & B	*Tuning Line
L502	.3 uh.
L503	.3 uh.
L504	2.2 uh.
L505	2.2 uh.
L506	2.2 uh.
L507	.3 uh.
L508	.3 uh.
L509	* uh.
L510	2.2 uh.
L511	2.2 uh.
L512	* uh.
L513	* uh.
L701	10 mh.

MISCELLANEOUS

M1	Fuse 2A
M2	#47 Pilot Light
M501	Modulator A
M502	Modulator B
M503	Matching Network
M601	Turret Attenuator

* Values of component parts subject to adjustment at the factory.

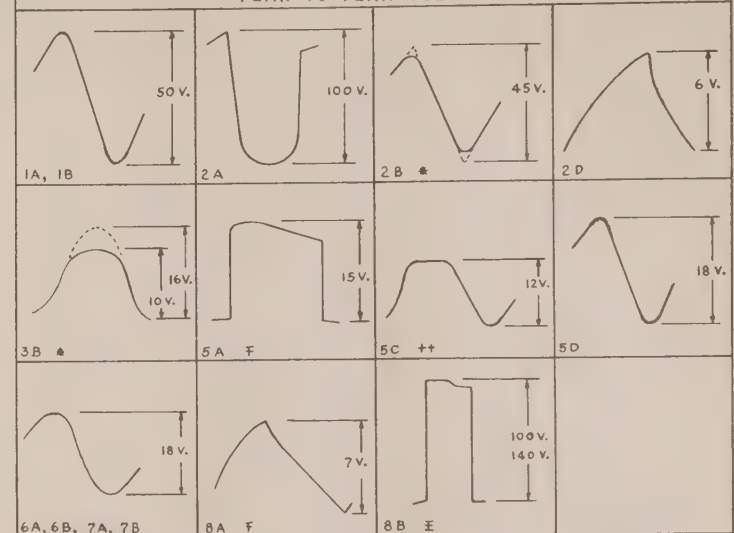


VOLTAGE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A	180	87			4.0			350	2.7 *		360	360		-2.2		340 AC	340 AC	LINE
B		152		3.0 *	19	-2.6		80 *			130						340 AC	LINE
C			283		-6.0			58 *	20		19						340 AC	
D		358						80 *				105						
E																		
F																		

ALL VOLTAGES TAKEN WITH 20,000 OHM/VOLT METER.
 OUTPUT LEVEL AND SWEEP WIDTH CONTROLS AT MAXIMUM ROTATION.
 * VOLTAGE VARIES WITH SETTING OF OUTPUT LEVEL CONTROL.
 ALL VOLTAGES MAY VARY $\pm 10\%$.

TYPICAL WAVE FORMS
 PEAK TO PEAK VOLTS

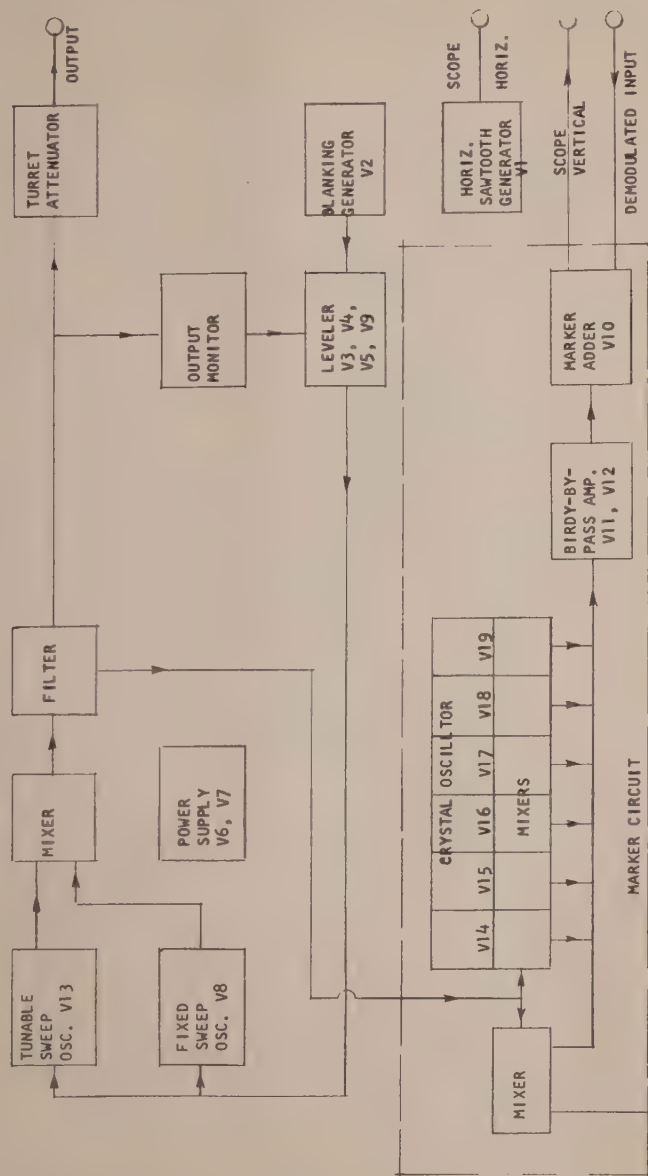


FRONT CONTROLS AT MAX. C.W. ROTATION SCOPE SET FOR 60~ SWEEP RATE, LINE SYNC.

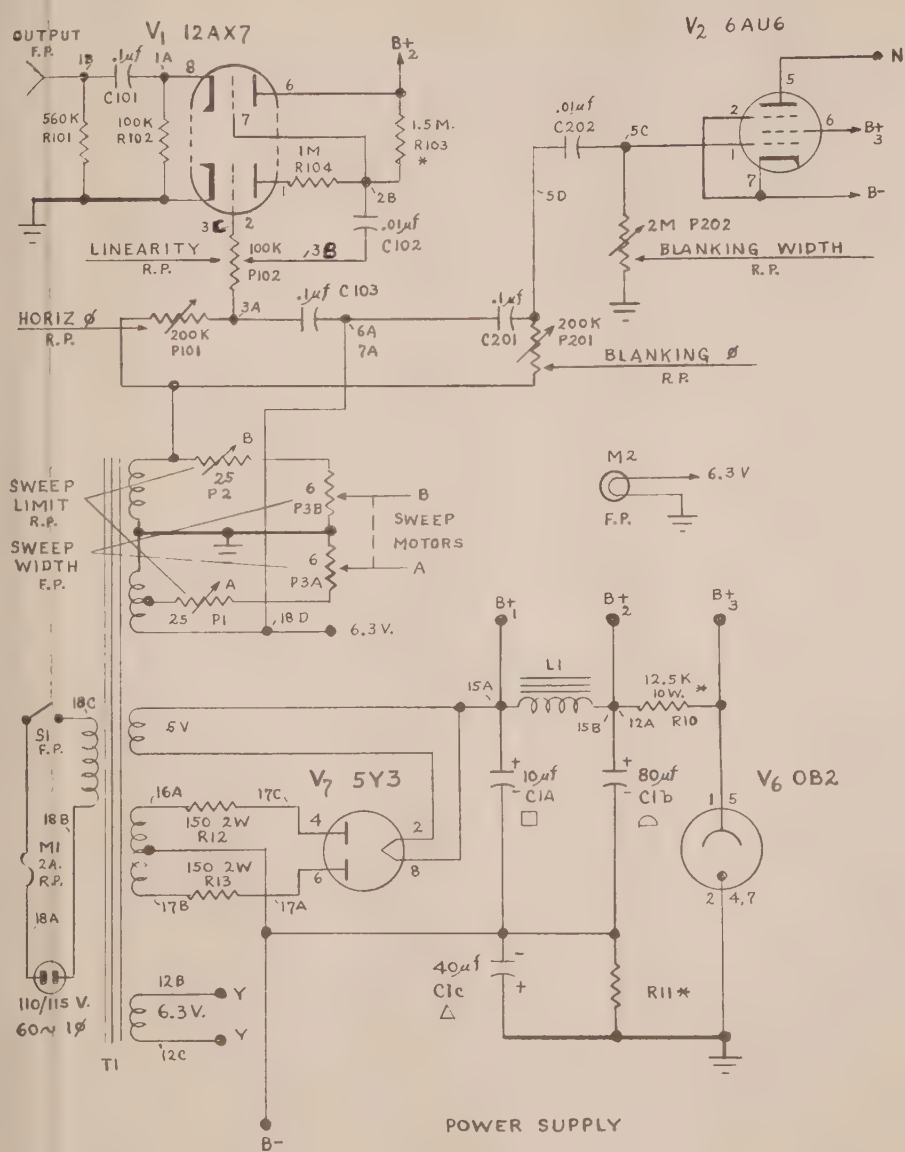
* SHAPE VARIES WITH SWEEP WIDTH CONTROL.
 F VARIES AMPLITUDE WITH OUTPUT LEVEL CONTROL.
 ++ VARIES AMPLITUDE WITH BLANKING WIDTH CONTROL.
 E VARIES AMPLITUDE WITH OUTPUT LEVEL CONTROL AND FREQUENCY SETTING.

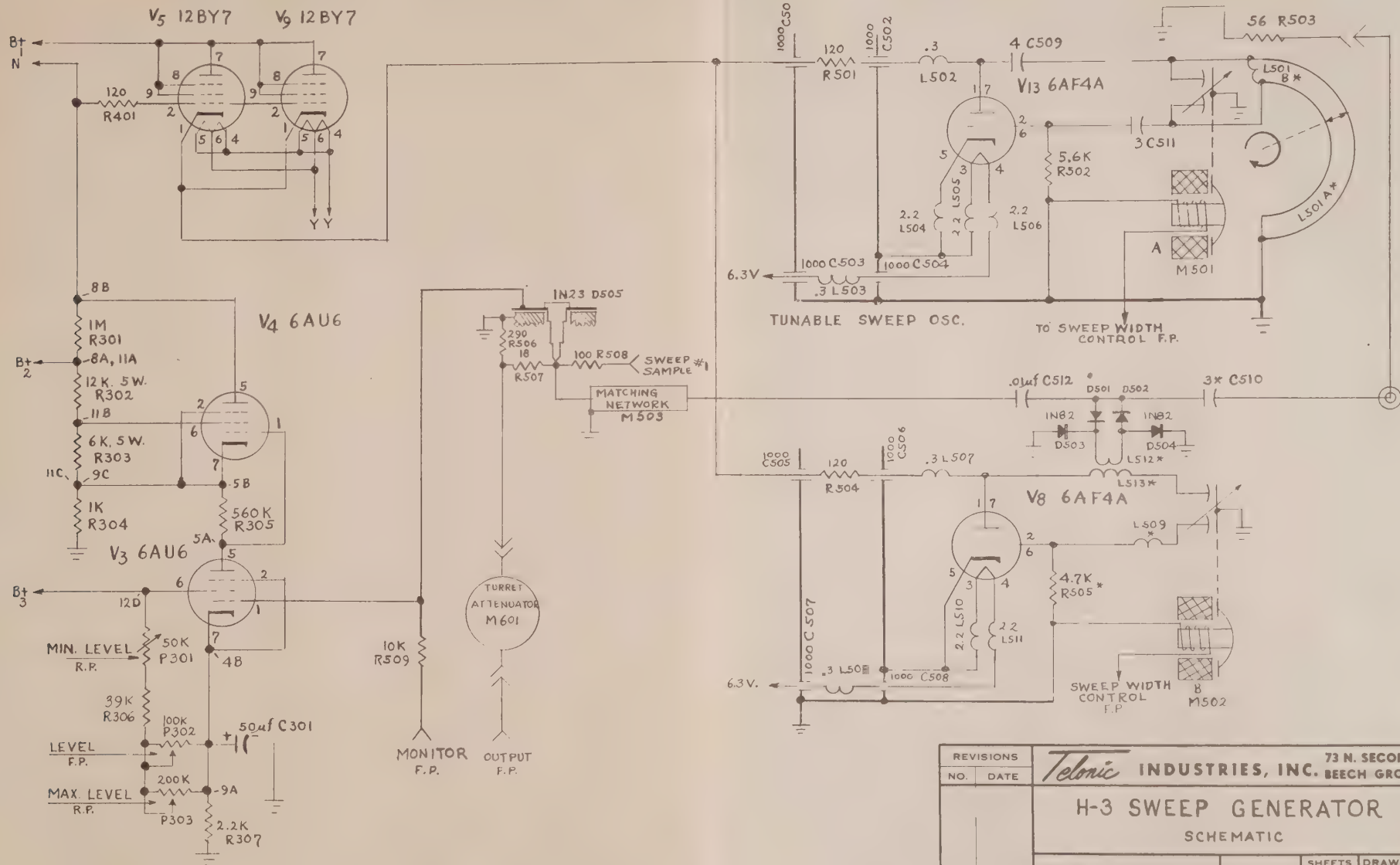
REVISIONS		Telonic INDUSTRIES		73 N. 2 ND. AVE. BEECH GROVE INDIANA	
NO.	DATE				
H3 TERMINAL BOARD VOLTAGE LEVELER & POWER SUPPLY				SCALE	SHEETS
				DRAWN BY BY <i>H. B. Jeter</i>	DATE Feb. 14, 1956
APP'D BY BY <i>RQA</i>				SHEET	DRAWING NO.
				1	B6-3/30

BLOCK DIAGRAM H3



EXTERNAL MARKER





WARRANTY

All materials and workmanship in this instrument are guaranteed to be free from defects (with the exception of vacuum tubes) for one year from date of purchase. This warranty does not apply if the unit has been altered, improperly handled or damaged in any way beyond our control.

RETURNING EQUIPMENT TO FACTORY

Factory service is available for repair and readjustment of this instrument. However, a description of the trouble plus the model and serial numbers of the unit should be forwarded first, whereupon instructions for correcting the trouble or authorization for returning the equipment will be given. This applies to all units whether under warranty or not. Units under warranty should be returned to factory, prepaid.

SWEEP GENERATORS FOR TESTING AND ALIGNMENT OF

BROADBAND F.M. DISCRIMINATORS

R.F. TUNING DEVICES

I.F. AMPLIFIERS

MATCHING DEVICES

RADAR, TELEMETERING

RADIO, TELEVISION

ANTENNAS

R.F. SWITCHING DEVICES

KLYSTRON TUBES

NEW TUBE DESIGNS

DELAY LINES

TRANSMISSION LINES

DEMODULATORS

R. F. MIXERS

R.F. FILTERS

DISTRIBUTION SYSTEMS

TRANSISTORS

FOR MEASUREMENT AND INDICATION OF

Gain	Coupling
Bandwidth	Leakage
Frequency Range	Attenuation
Frequency Response	Mechanical Faults
Spurious Response	Noise
VSWR	Efficiency

Telonic INDUSTRIES, INC.

Telonic designs and manufactures

SWEEP GENERATORS

Featuring

High Signal Level

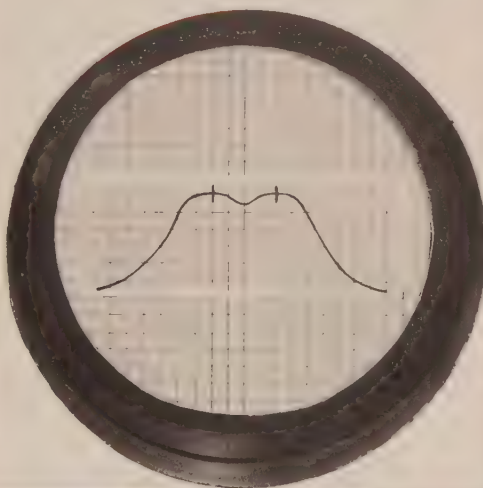
Low Leakage

Flat Output

Low Source VSWR

Accurate Marker Systems

MANY MODELS—Many frequency ranges



To facilitate your requests for quotations and orders, a handy form may be obtained from your field engineer or from TELONIC.

Telonic INDUSTRIES, INC.

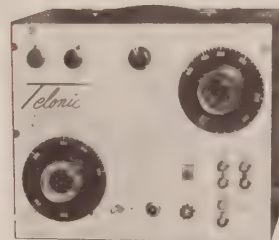
BEECH GROVE, INDIANA

TWX—IP-254

Phone—StAt 6-9239

THE MASTER LINE SWEEP GENERATORS

ALL FUNDAMENTAL FREQUENCY



Model S5-MT
Portable Style

MASTER LINE—Tunable and Fixed SWEEP GENERATORS

Model	SWEEP	
	Range	Sweep Width
S1-T	100-200 mc.	30%
S2-T	175-350 mc.	15%
S3-T	225-500 mc.	10%
S3A-T	440-920 mc.	6%
S4-T	950-1250 mc.	4%
S200-T	260-440 mc.	180 mc.
S211-T	325-500 mc.	175 mc.
S212-T	500-750 mc.	250 mc.
S213-T	650-950 mc.	300 mc.
S214-T	800-1200 mc.	400 mc.
S215-T	900-1250 mc.	350 mc.
S216-T	1200-1400 mc.	200 mc.
S101-T	50-90 mc.	40 mc.
	160-220 mc.	60 mc.

Output—Over 1 volt p. to p.

Impedance—50 ohms

Flatness—5% at max. sweep width

Vernier Attenuation—0-approx. 20 db.

(See general specs. and features on back page)

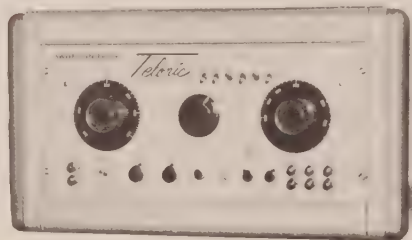
ATTENUATOR AND MARKER SYSTEMS

Type	Description
"T"	TA-50 Attenuator
"M"	4 plug-in fixed markers. Each adj. over wide range. Stability better than .1%.
"C"	4 plug-in crystal-controlled markers with .005% accur. Available for sweep ranges to approx. 600 mc.
"M"	Variable, individually calibrated marker with .25% accur. covering full sweep range.
"D"	6 plug-in fixed or crystal-controlled markers; variable marker; 10 mc. harmonic marker.

(The "F" "C" "M" & "D" systems include Birdy-By-Pass circuitry)

THESE BASIC MODELS use sweep oscillators operating at fundamental frequency and are available in many ranges up to the limit of the standard receiver-type tube (6AF4A) and tuned-line circuitry. The listed models illustrate the ranges and sweep widths that may be obtained. *High outputs*, exceptional *uniformity* (flatness) and *purity* (freedom from harmonic and spurious content) are prime features of these models.

The model 200 series are fixed-tuned and sweep the entire range. This series is particularly useful for checking tuning devices, antennas, transmission line, broad-band amplifiers, and in making VSWR measurements, etc. The wide sweep technique is a new and powerful tool for *designing* as well as for *production*.



Deluxe Model S5-DT
Bench Style

THE SWEEP OSCILLATOR circuitry is contained in a tightly-shielded compartment that almost completely eliminates radiation. The precision vibrating capacitor consists of a silver-plated beryllium copper diaphragm. This all-metal unit has no tendency to warp or fatigue. The exceptionally long-life of this wobulator is one of the reasons for the low maintenance cost of Telonic sweep generators.

OUTPUT LEVELING circuitry, using the same technique as in almost all regulated D.C. power supplies, is largely responsible for the high degree of flatness obtained in all Telonic sweep generators.

ORDERING INFORMATION

Designate model by adding appropriate symbols.

- S5 —Basic unit—portable style.
- S5-T —with TA-50 attenuator—portable style.
- S5-FI —with 4 plug-in fixed markers and attenuator—portable style.
- S5-CT —with 4 plug-in crystal-controlled markers and attenuator—portable style.
- S5-MT —with variable marker and attenuator—portable style.
- S5-DT —Complete marker system, attenuator — bench style.

ULTRA RANGE SWEEPS H-1, H-2, H-3

ULTRA WIDE SWEEP WIDTHS are obtained by heterodyning two UHF oscillators whose construction is similar to that of the MASTER LINE units (6AF4A tubes operating at below 1000 mc.) The high signal level of the oscillators and the use of balanced mixer circuitry result in a stable, high level output.

THE TELONIC H-1 is similar to the MASTER LINE Model S3A-T, but, in addition to the fundamental range of 380-900 mc., it has a heterodyne range of 1-380 mc. The output of a fixed oscillator at 500 mc. is mixed with the UHF signal to provide the low range.

Ranges—1-380 mc. and 380-900 mc.

Sweep Width—250 kc-40 mc.

Flatness—H1 range—5% at maximum sweep width
LO range—5% at sweep width of 10 mc.

Output—H1 range—1 v. p. to p.
LO range—.2 v. p. to p.

Impedance—50 ohms

Attenuator—TA-50 (See Atten. specs.)

Vernier Atten.—0 to over 10 db.

Style—Portable

(See general specs. and features on back page)

THE TELONIC H-2 and H-3 achieve very wide sweep widths by heterodyning *TWO SWEEP OSCILLATORS*. Since they are sweeping 180° out of phase with each other, the sweep widths are additive. The output leveling circuit maintains a flat output over the entire range. Tuning one oscillator tunes the center frequency of the heterodyne output, and varying the drive voltage of both wobblers varies the sweep width.

These unique instruments are very useful in the designing and testing of broad-band video, IF, and RF amplifiers, filters, impedance matching devices, etc.

SPECIFICATIONS

H-2

Center Frequency—1-200 mc.

Sweep Width—200 kc-200 mc.

Output—.4 v. p. to p.

Impedance—50 ohms (or 75)

Flatness—15% to 150 mc.
20% to 300 mc.

Attenuation—Toggle Switch 20,20,
10,6,3, db & vern. 0-10 db.

Marker—External marker input
only

Style—Portable

(See general specs. and features on back page)

H-3

1-200 mc.

200 kc-200 mc.

Over .5 v. p. to p.

50 ohms (or 75)

15% to 300 mc.

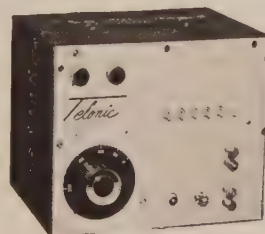
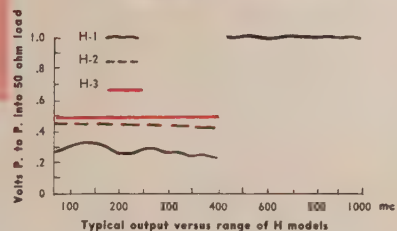
TA-50 (or TA-75)
& vern. 0-10 db.

6 Markers—Type
"C" or "F" and
Birdy-By-Pass System

Bench



Model H-1



Model H-2



Model H-3

EXTENDED RANGE SWEEPS

A series of instruments covering the range of 950-2300 mc. is accomplished by a new sweep generator design. Broad frequency coverage and wide sweep widths are obtained without resorting to the more complicated techniques normally used at these frequencies. A TELONIC MASTER LINE UHF sweep oscillator, a harmonic generating crystal and high-pass filter provide a high level, spurious-free signal at twice the frequency of the oscillator. Voltage leveler circuitry maintains constant output.

This new line of sweep generators is available with fixed or tunable center frequencies and with or without marker systems. The standard MASTER LINE Marker systems are available.

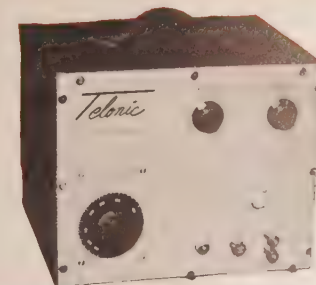
Output—.5 v. p. to p. into 50 ohms

Impedance—50 ohms—Type "N" Conn.

Flatness—10% on tunable models
15% on fixed models
measured at max. sweep width

Attenuation—Vernier atten. 0-20 db.

(See general specs. and features on back page)



Model E2

Model	Range	Sweep Width
E1	920-1400 mc.	0-50 mc.
E2	1200-2000 mc.	0-50 mc.
E3	1700-2300 mc.	0-50 mc.
E4	1000-1400 mc.	400 mc.
E5	1400-1800 mc.	400 mc.
E6	1700-2300 mc.	600 mc.

ELECTRONIC SWEEPS



These ultra flat sweep generators are swept electronically using a saturating reactance. Continuous tuning is accomplished by means of a precision variable capacitor.

Toggle switches and constant impedance resistive pads provide a very convenient and accurate means of attenuation

The performance of these models approaches perfection—output is well over 1 volt, flatness better than 5%. There is very low spurious and harmonic content and the leakage is so low that even high gain Radar IF strips are unaffected.

Model	Center Freq.	Sweep Width
E1	450-1800 kc.	0-100%
E2	1.5-5.0 mc.	0-100%
E3	5-15.0 mc.	0-50%
E4	10-25 mc.	0-50%
E5	25-70 mc.	0-40%
E6	50-125 mc.	0-30%

Output—well over 1 volt p. to p.

Impedance—50 ohms

Attenuation—Toggle switch 20,20,20,10,6,3 db.
& vernier atten. 0-10 db.

Flatness—Within 5% over max. sweep width

(See general specs. and features on back page)

Add "C" to Model No. for Xtal Marker system employing 6 plug-in crystal-controlled markers and Birdy-By-Pass circuitry—i. e. L1-C

Add "M" for Variable Marker and Birdy-By-Pass circuitry—i. e. L1-M

Add "D" for Deluxe instrument with 6 plug-in markers, variable marker, harmonic marker, and Birdy-By-Pass circuitry—i. e. L1-D

Telonic

VHF Sweep-Marker Generators

FOR TV PRODUCTION, ENGINEERING, SERVICING

TELONIC sweeps are being used by a majority of the TV equipment manufacturers, including RCA, GE, Admiral, Oak, and GI. The features that are making them so popular are their excellent specifications (flatness, high output, wide sweep, etc.), efficient design (compact size and shape, simplicity of operation, accessibility for easy servicing),

outstanding performance (dependability, low maintenance), and the ability of TELONIC to modify standard specifications to meet individual needs.

Obsolete installations are being replaced with TELONIC units to increase production efficiency, reduce maintenance costs and to improve the quality of the product.

Bulletin 203 A

New!

Model SV-6 BG

The new model SV-6 supersedes all previous models, SV-3, SV-3A and other special modifications that have been made available previously. It has the same basic circuits and convenient sub-chassis layout, but has improved electrical characteristics and a new panel arrangement. BNC connectors are used for greater convenience and standardization of connecting cables, as well as elimination of noise and hum pick-up that can occur when binding posts are used.

An engraved black anodized dial is standard on this model.

The flatness of this series is held to less than 5% over the entire sweep width, and to 1 or 2% between markers. A voltage doubler detector circuit monitors the complete RF output envelope. A three stage high gain DC-coupled amplifier amplifies any deviation and compensates for it by instantaneously changing the B+ to the sweep oscillator.

This method of producing a flat output has excellent long and short time stability and is unaffected by aging of parts and line voltage fluctuations.

Sweeping is accomplished electronically by magnetically saturating a ferrite core and thus changing the inductance of the oscillator tank circuit. The particular type of ferrite used has characteristics that produce a very linear change of frequency. This 13-position sweep generator uses a separate crystal on each channel to produce 2 pulse markers, one on the video and one on the sound frequencies. A special circuit forms pulses with much greater ac-



CONDENSED SPECIFICATIONS

Range—12 channels & 43 mc. I.F.

Sweep Width—25 mc. adjustable

Output—Well over 1 v. p. to p. into 75 ohms

Impedance—75 ohms (300 ohms balun included with each instrument)

Flatness—5% over each channel (2% between markers)
10% over all

Attenuation—20, 20, 10, 6, 3 & 10 db. vern. atten.

Markers—Pulse-type markers on video and audio

Style—Portable

curacy and stability than the usual multivibrator method. The positive pulse output is available on the front panel to be used to produce intensity markers or as sharp rectangular spikes, independent of the device under test, when connected to the CRT deflection plates.

Special features of this compact VHF-TV sweep and marker generator are: electronic sweep; 25 mc. sweep width; hi-level, flat output; special crystal-controlled pulse markers, and removable sweep and marker sub-chassis. Solid silver switch section contacts and clips are used for long switch life.



Model SV-6AEG

OPTIONAL FEATURES

- A** An attenuator having steps of 20, 20, 20, 20, 10, 6, 3. Other combinations of values not higher than 20 db each and not over 7 steps may be ordered.
- B** A dual attenuator having steps of 20, 20, 10, 6, 3, db on each section. The input of each attenuator is common. This arrangement is used to make connections to fixture for both IF and RF testing of TV front ends and for dual trace presentation for comparison to a standard unit.
- C** An extra marker on the IF position. One or sometimes two of these crystal controlled oscillators may be used to

provide one or two markers in addition to the video and sound marker on the IF Channel.

Line voltage. Special line voltage may be specified on standard American models.

RF output monitor. A crystal diode circuit may be added at the output of the attenuator to indicate the RF level at that point. This is often used in making VSWR and impedance measurements.

Foreign specifications. The *channel audio* and *sound marker* frequencies as well as line voltage and frequency specifications may be obtained.

Sweep width and centering panel controls. These controls which are normally used as internal adjustments may be installed on the front panel. This is desirable for engineering use.

Sine wave sweep. A sinusoidal sweep voltage may be substituted for the normal sawtooth which permits the use of the sine sweep present on some oscilloscopes.

Special features. Other modifications, not mentioned above, may be requested.

ORDERING DATA

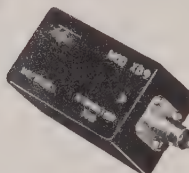
In ordering the SV-6 any of the following modifications may be specified. The modification letter, or letters, should be added to the model No. SV-6 (i.e., a unit with sweep width and centering controls on the front panel would be called SV-6G and a unit with this feature plus 40 db. additional attenuation would be called SV-6AG).

The above letter designations apply only to the Model SV-6

VHF ACCESSORIES

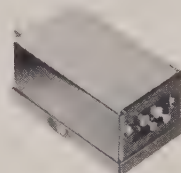
These detectors and balun are particularly recommended for use with Telonic VHF sweep generators.

RF DETECTORS



XD-9

VHF BALUN



BA-1

SPECIFICATIONS

Frequency range

1—250 mc.

Impedance

75 ohms

Connector

BNC input
BNC output

VSWR

1.2:1

XD-10

1—250 mc.

300 ohms balanced

Special input
BNC output

1.2:1

BA-1

Channel 2—13

75 to 300 ohms

BNC input
Special output

1.2:1

MODEL SV-2

The SV-2 has the wide, flat, sweep characteristics of the SV-6, but has no marker system or horizontal output. Since the sweep is sinusoidal, the 60-cycle sine sweep present in many oscilloscopes is used.

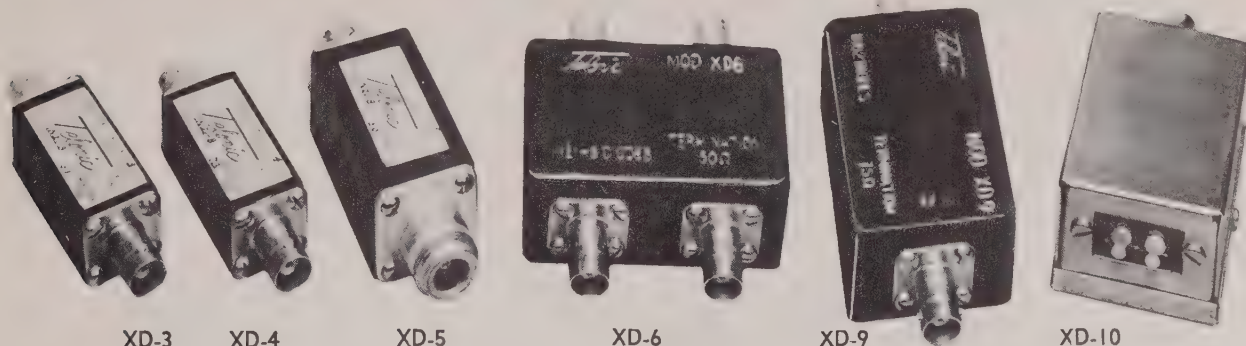


Telonic

INDUSTRIES, INC.

75 NORTH SECOND AVE.
BEECH GROVE, INDIANA

for Detection of R. F. Signals



- Excellent match.
- Small size—light weight.
- Rugged construction—machined, anodized aluminum block.
- Crystals easily replaced.
- Simple, foolproof design.
- Standard resistance terminations.

These RF detectors are designed to provide the high degree of accuracy needed to fully utilize the flat output characteristics of modern-day precision sweep and signal generators.

The necessary electrical considerations for low VSWR are met while maintaining excellent mechanical factors such as: small size, light weight, rugged construction and easily-replaced diodes.

MODEL XD-3, XD-4, XD-5

The XD-3, XD-4 and XD-5 are extremely useful for a great variety of RF applications besides being used with Telonic sweep generators. The VSWR of these detectors is largely determined by the dimensions of the cavity and by the type of connectors used. The low VSWR of the XD-5 and the XD-3 is made possible by the use of a "N" type connector on the XD-5 and a special BNC connector on the XD-3. With standard polarity diodes, the output is negative.

MODEL XD-6, XD-7

These detectors are similar to the XD-3 and XD-4 except that twin circuits are used which allow choice of output voltage polarity.

MODEL XD-8, XD-9

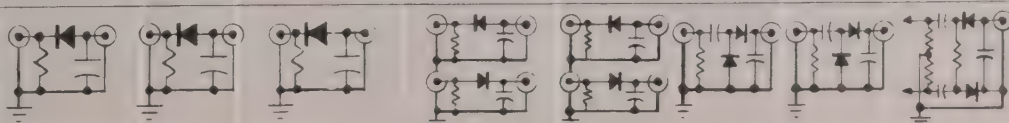
These detectors utilize a voltage doubler circuit which has the obvious advantage of higher output. The most outstanding feature is that the entire envelope of RF is detected and thus errors due to non-symmetry and waveform distortion are minimized and greater accuracy is obtained.

MODEL XD-10

This 300 ohm detector, largely of interest to the TV industry, has a termination that is balanced to ground. Since balanced detection is used, the entire envelope is detected and non-symmetry and waveform distortion errors are lessened, thus obtaining greater accuracy.

SPECIFICATIONS

Model	XD-3	XD-4	XD-5	XD-6	XD-7	XD-8	XD-9	XD-10
Frequency Range-MC.	1-1000	1-250	1-1000	1-250	1-250	1-250	1-250	1-250
Termination Ohms	51	73	50	51	75	51	75	300
VSWR:1	1.1-500 MC. 1.2-1000 MC.	1.3	1.05-500 MC. 1.1-1000 MC.	1.2-500 MC. 1.1-250 MC.	1.2	1.1	1.2	1.2
Input and Output Connections	"BNC"	"BNC"	"N" Input "BNC" Output	"BNC"	"BNC"	"BNC"	"BNC"	Special Lugs "BNC" Output
Termination Power Rating	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Crystal Diodes (Other similar types may be used)	IN21B	IN21B	IN21B	IN21B	IN21B	IN82	IN82	IN82
Type	Half Wave	Half Wave	Half Wave	2 Half Wave Units	2 Half Wave Units	Voltage Doubler	Voltage Doubler	Balanced



FOR TV PRODUCTION, ENGINEERING, SERVICING

TELONIC sweeps are being used by a majority of the TV manufacturers. The features that are making them so popular are their excellent specifications (flatness, high output, wide sweep, etc.) efficient design (compact size and shape, simplicity of operation, accessibility for easy servicing); outstanding performance (dependability, low maintenance); and the ability of TELONIC to modify standard specifications to meet individual needs.

Obsolete installations are being replaced with TELONIC units to increase production efficiency, reduce maintenance costs and to improve the quality of the product.

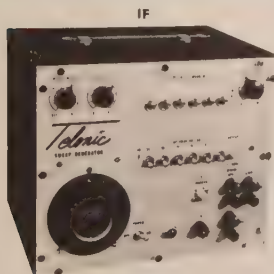


Model S3A-FT

The S3A-FT is an ideal UHF TV test instrument that has high level, flat output, wide sweep, four plug-in fixed adjustable markers with Birdy-By-Pass system and a precision Step-Attenuator. A four position detent system as shown above is also available. (Specify DT-4 detent system if desired.)

- Range—440-920 mc.
- Width—0-50 mc. at 500 mc.
- Output—Well over 1 v. p. to p. into 50 ohms
- Flatness—5% over max. sweep
15% over entire range
- Attenuation—TA-50 & vernier atten. 0-10 db.
- Markers—4 Plug-in Fixed markers with Birdy By-Pass system
- Style—Portable

(See general specs. and features on back page)



Model L5A-P



Model SV-3

This 13-position sweep generator uses a separate crystal on each channel to produce 2 pulse markers, one on the video and one on the audio frequencies. A special circuit forms pulses with much greater accuracy and stability than the usual multivibrator method.

Special features of this compact VHF-TV sweep and marker generator are: electronic sweep; 25 mc. sweep width; hi-level, flat output; special crystal-controlled pulse markers; and removable sweep and marker sub-chassis.

- Style—Portable
- Range—12 channels & 43 mc. I.F.
- Sweep Width—25 mc. adjustable
- Output—Well over 1 v. p. to p. into 75 ohms
- Impedance—75 (300 ohms balun supplied) ohms
- Flatness—5% over each channel—10% over all
- Attenuation—20,20,20,10,6,3 & 10 db. vern. atten.
- Markers—Pulse-type markers on video and audio
- Style—Portable

(See general specs. and features on back page)

This TV IF sweep, Model L5A-P, and crystal-controlled marker generator is a variation of an L Model. 6 crystals are used in passive networks to accurately key pulse markers.

- Center Frequency—35-55 mc.
- Sweep Width—4-15 mc.
- Output—1 v. into 75 ohms
- Attenuation—20,20,20,10,6,3 and 10 db. vernier atten.
- Markers—6 Crystal—controlled pulse-type markers
- Style—Portable

(See general specs. and features on back page)

TURRET



TA-50, TA-75

Attenuation—0,10,20,30,40, 50 db.
Size—2 1/8" x 1 3/4"

Impedance—50 or 75 ohms
VSWR—1.2:1 to 500 mc.
1.3:1 to 1000 mc.

Shaft—2" x 1/4" round

Accuracy—.25 db. on all steps to 10 db.
.5 db. on higher steps

Connectors—BNC

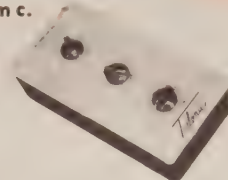
Power—1/2 watt average, 1 kw peak
(Mounts like a potentiometer)



TB-50, TB-75

Attenuation—0,1,2,3,4,5,6, 7,8,9,10,20 db.
Size—3" x 1 3/4"

DECADE



TAD-50
TAD-75

Two 6-position and 12-position attenuators arranged in decade allow any combination up to 110 db. in 1 db. steps.

Attenuation—0-110 db.

Impedance—TAD-50—50 ohms
TAD-75—75 ohms

VSWR—1.2:1 to 500 mc.
1.3:1 to 1000 mc.

Accuracy—.25 db. to 10 db.
1.25 db. to 110 db.

Size—9 1/2" x 3" x 4 3/4"

TOGGLE SWITCH ATTENUATORS—Several models available—up to 100 db. in 1 db. steps—Range—DC—200 mc.
Also, Toggle Switch Attenuators built to order. Write for complete information.

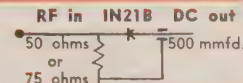
RF DETECTORS



Frequency Range—1-1000 mc.
(useful to 2500 mc.)

VSWR—1.05:1 to 500 mc.
1.1:1 to 750 mc.
1.2:1 to 1000 mc.

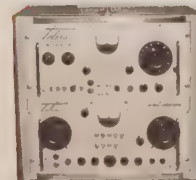
Small, black anodized aluminum block. Easily-replaced crystal.



Models	Imped.	Connectors
XD-3	50 ohms	BNC
XD-4	75 ohms	BNC
XD-5	50 ohms	N

NEW TELONIC INSTRUMENTS

RADAR TEST SET



MOD. SSX-1/PAM-1

Complete signal source for testing Radar IF strips
Includes: AUDIO — 50 WATT VIDEO PULSE — C.W.
PULSE — C.W. — MODULATED C.W. — R.F. SWEEP
— VARIABLE MARKER — CRYSTAL HARMONIC MARKER.

(Detailed spec. sheet available from Telonic or Telonic representatives)

DOUBLE RANGE SWEEPS



A new "double" range sweep generator is now available. This multi-purpose unit includes two sweeping oscillators—one wide-band fixed tuned oscillator and the other a normal tunable sweep oscillator covering the same frequency. Frequency ranges, styles, and markers of either the Master Line or the Extended Range may be provided.

Model is designated by combining the number of the standard tunable and fixed sweeps. (I.E.: E3-203-D)

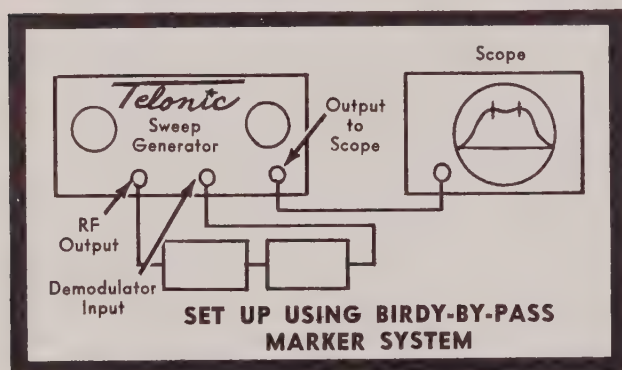
DESCRIPTION OF MARKER SYSTEMS

BIRDY-BY-PASS

The Birdy-By-Pass marker system is standard on the MASTER LINE, H-3, EXTENDED RANGE, and the ELECTRONIC SWEEP models.

In this system, beat or birdy pips are produced by mixing a sample of the sweep oscillator signal with the marker output; the "birdies" are fed through an amplifier and are added to the demodulated sweep signal before it is connected to the scope vertical amplifier. The markers completely bypass the device under test.

Since the markers are produced directly, no frequency error can occur other than in the marker oscillator itself. Thus, the error that is present in the pulse system, due to keying of the multivibrator, is avoided. In addition to its major features—accuracy, stability and versatility, it has the advantage of simplicity, allowing this system to be used on the Portable style models.



CABINET STYLES

PORTABLE STYLE

The Portable Style is particularly appropriate in applications where space is at a premium. The cabinet measures only 10" x 12" x 9½" and weighs approx. 25# (Shpg. wt 40# approx.) Louvers on the sides and perforated panels on the top provide ventilation. Leather handle and the compact size allow for easy-carrying. This style is used on standard Telonic sweep generators, except the H-3 and Deluxe models.

BENCH STYLE

The Bench style is used on Deluxe models and H-3 and provides ample panel and chassis space for combination marker systems and extra features. The studio-type cabinet measures 23" x 16" x 13". These models weigh approx. 50# (Shpg. wt. 100# approx.) Chrome-plated handles are provided on each side. The back is partially open and the top and bottom are removable for easy servicing and adjustment of unit.

PLUG-IN MARKERS*

Plug-in markers of two types are available, either crystal-controlled oscillators with an accuracy of .005% or fixed oscillators adjustable over a wide range with a stability of .1%. Extra units may be obtained from TELONIC to provide for changing requirements.

(*Designated by "C" for Crystal type; "F" for Fixed type)

CALIBRATED VARIABLE MARKER*

A calibrated variable marker is available for nearly all ranges. They are individually calibrated and engraved to an accuracy of .25% at intervals spaced for best readability.

(*Designated by "M" in Model No.)

CRYSTAL-CONTROLLED HARMONIC MARKERS*

Crystal-controlled harmonic markers are available in Deluxe Models utilizing the Birdy-By-Pass marker system. Crystal oscillator and frequency multiplier circuitry produces markers at multiples of the crystal frequency. The following frequencies are available:

Above 1200 mc. — 20 mc.

Above 500 mc. — 10 mc.

Below 500 mc. — 5 mc.

Below 100 mc. — 2.5 mc.

Low Ranges — 1 mc.

FEATURES AND SPECIFICATIONS COMMON TO ALL MODELS

Zero Base Line—Return sweep is blanked

Horiz. Sweep Voltage—Sawtooth of approx. 40 volts peak to peak

Radiation—Less than 10 microvolts

Source VSWR—Normally below 1.2:1

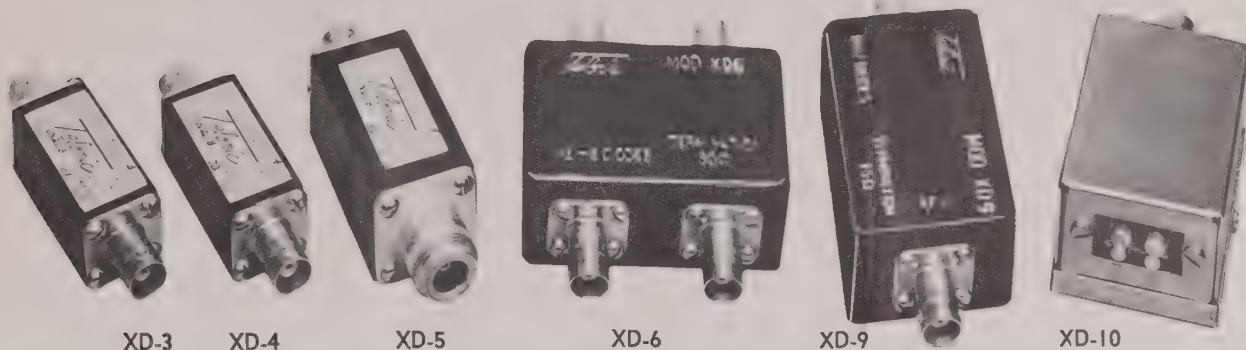
Display Linearity—Better than 1.2:1

Power—115 v. 60 cps (50 cps available)

DT-4 Tuning Detent

A 4 position mechanism may be added to the sweep generator's tuning dial as a production aid. Each position is easily adjusted from the front of the instrument.

for Detection of R. F. Signals



- Excellent match.
- Small size—light weight.
- Rugged construction—machined, anodized aluminum block.
- Crystals easily replaced.
- Simple, foolproof design.
- Standard resistance terminations.

MODEL XD-3, XD-4, XD-5

The XD-3, XD-4 and XD-5 are extremely useful for a great variety of RF applications besides being used with Telonic sweep generators. The VSWR of these detectors is largely determined by the dimensions of the cavity and by the type of connectors used. The low VSWR of the XD-5 and the XD-3 is made possible by the use of a "N" type connector on the XD-5 and a special BNC connector on the XD-3. With standard polarity diodes, the output is negative.

MODEL XD-6, XD-7

These detectors are similar to the XD-3 and XD-4 except that twin circuits are used which allow choice of output voltage polarity.

These RF detectors are designed to provide the high degree of accuracy needed to fully utilize the flat output characteristics of modern-day precision sweep and signal generators.

The necessary electrical considerations for low VSWR are met while maintaining excellent mechanical factors such as: small size, light weight, rugged construction and easily-replaced diodes.

MODEL XD-8, XD-9

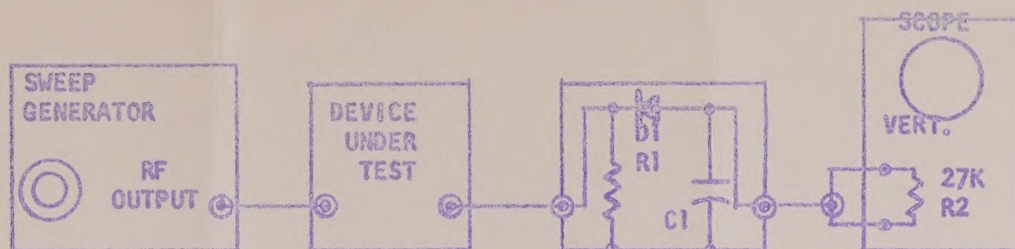
These detectors utilize a voltage doubler circuit which has the obvious advantage of higher output. The most outstanding feature is that the entire envelope of RF is detected and thus errors due to non-symmetry and waveform distortion are minimized and greater accuracy is obtained.

MODEL XD-10

This 300 ohm detector, largely of interest to the TV industry, has a termination that is balanced to ground. Since balanced detection is used, the entire envelope is detected and non-symmetry and waveform distortion errors are lessened, thus obtaining greater accuracy.

SPECIFICATIONS

Model	XD-3	XD-4	XD-5	XD-6	XD-7	XD-8	XD-9	XD-10
Frequency Range-MC.	1-1000	1-250	1-1000	1-250	1-250	1-250	1-250	1-250
Termination Ohms	51	73	50	51	75	51	75	300
VSWR:1	1.1-500 MC. 1.2-1000 MC.	1.3	1.05-500 MC. 1.1-1000 MC.	1.2-500 MC. 1.1-250 MC.	1.2	1.1	1.2	1.2
Input and Output Connections	"BNC"	"BNC"	"N" Input "BNC" Output	"BNC"	"BNC"	"BNC"	"BNC"	Special Lugs "BNC" Output
Termination Power Rating	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Crystal Diodes (Other similar types may be used)	IN21B	IN21B	IN21B	IN21B	IN21B	IN82	IN82	IN82
Type	Half Wave	Half Wave	Half Wave	2 Half Wave Units	2 Half Wave Units	Voltage Doubler	Voltage Doubler	Balanced



Typical Application

- R1 -- Proper termination for output of device under test and type of cable used.
- C1 -- RF bypass capacitor
- R2 -- External resistor added to determine the frequency response of the low-pass detector output circuit. A value, in the order of 27K, is recommended for sweep generator applications. The back resistance of the crystal is in parallel with R2 and also has effect upon the time constant.
- D1 -- 1N21-B crystal diode.

SPECIFICATIONS

FREQUENCY RANGE	1-1000 mc. (useful to higher frequencies)
TERMINATION	Plus or minus 4% DC measurement.
VSWR	Less than 1.2 to 1000 mc.
TERMINATION POWER RATING	$\frac{1}{2}$ watt

Replacing the crystal

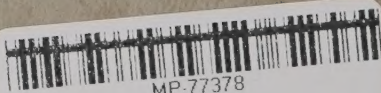
1. Remove the terminal on the DC output end of the Detector.
2. Insert new crystal in the clip.
3. Replace the terminal being careful to guide the tip of the crystal into the contact pin.

Replacing Termination Resistor

1. Remove the RF Input terminal.
2. Replace resistor with either Allen-Bradley or IRC resistor being careful to maintain exact position and lead length.
3. Replace the RF Input terminal.

WARRANTY

All materials and workmanship in this unit are guaranteed to be free from defects from one year from date of purchase. This warranty does not apply if unit has been altered, improperly handled or damaged in any way beyond our control.



MP-77378